

CLAIMS

We claim:

- 1) A method of processing material, comprising:
 - a. placing the material onto a milling line for processing;
 - b. initializing a sensor positioned to sense a measurement of a predetermined characteristic of a predetermined portion of the material, the sensor protected by a sensor housing;
 - c. initializing a stepper motor, disposed proximate the line, to a predetermined position;
 - d. processing the material at a predetermined location along the milling line;
 - e. sensing a predetermined characteristic of the material on the milling line;
 - f. calculating an adjustment of the material in a predetermined plane using the sensed characteristic;
 - g. sending a signal to the stepper motor based on the calculated adjustment, if the adjustment is non-zero; and
 - h. retaining the sensed characteristic of the material for certification of the sensed characteristic.

- 2) The method of claim 1 wherein step (e) further comprises sensing a predetermined characteristic of the material on the milling line by physical contact of the sensor with the material to be processed.

- 3) The method of claim 1 wherein the sensed characteristic comprises a measurement of a predetermined portion of the material in a single plane.
- 4) The method of claim 1 wherein the sensed characteristic comprises a measurement of length of at least one side of the material and a diagonal of the material.
- 5) The method of claim 1 wherein the sensed characteristic comprises a measurement of length of a plurality of sides of the material and a calculated diagonal of the material.
- 6) The method of claim 1 further comprising generating a certification of the predetermined characteristic based on the retaining sensed characteristic.
- 7) The method of claim 6 wherein the certification comprises a report indicative of calculated “real-time” statistical process control charts, listings of dimensions as processed, and capability process charts.
- 8) The method of claim 6 wherein the certification is generated in real-time.
- 9) The method of claim 1 wherein the material is at least one of metal, plastic, glass, paper, organic materials, and composites.

- 10) The method of claim 1 wherein the processing is at least one of cutting, shaping, etching, assembling, welding, progressive dies, stamping, and riveting.
- 11) A device for processing material, adaptable for use with an existing manufacturing device, comprising:
- a. a milling line, comprising:
 - i. a table on which material may be placed for processing; and
 - ii. a materials processor;
 - b. at least one stepper motor disposed proximate the milling line, the stepper motor useful to control a directional movement of material placed onto the milling line for milling, the stepper motor operatively in contact with the material to affect positioning of the material on the table;
 - c. a mainframe disposed proximate the existing manufacturing device;
 - d. a positioner disposed proximate a first end of the mainframe;
 - e. a protected sensor for sensing a predetermined characteristic of the material, the sensor disposed proximate the mainframe and the materials to be processed;
 - f. a controller for issuing stepper motor commands;
 - g. a measurement sensor disposed proximate the mainframe, the sensor capable of measuring a predetermined dimension of the material in real-time; and

- h. a computer operatively in communication with the controller and the sensors, the computer programmed to:
 - i. receive signals from the measurement sensor;
 - ii. receive the measured predetermined dimensions of the material in real-time from the controller;
 - iii. issue control directives to the controller for use in controlling the stepper motor; and
 - iv. concurrently generate a certification of the measured predetermined dimensions.

12) The system of claim 11 further comprising a plurality of stepper motors.

13) The system of claim 11 further comprising a tensioner connected to the stepper motor for maintaining a predetermined pressure between the stepper motor and the material.

14) The system of claim 11 wherein the measurement sensor is at least partially in physical contact with the material to be processed.

15) The system of claim 11 wherein the measurement sensor comprises pressure sensors, acoustic sensors, and optical sensors.

- 16) A device for processing a material, comprising:
- a. a milling table for movably accepting material to be processed;
 - b. a plurality of stepper motors operatively connected to the milling table, at least one first stepper motor being capable of moving the material in a first plane;
 - c. a materials processor;
 - d. a measurement sensor situated within a sensor housing;
 - e. a controller operatively connected to the measurement sensor and the plurality of stepper motors; and
 - f. a computer operatively in communication with the controller;
 - g. wherein
 - i. the computer calculates an adjustment of the material on the milling table using a sensed measurement;
 - ii. the computer provides the controller with data useful in controlling at least one of the stepper motors based on the calculated adjustment; and
 - iii. the computer concurrently generates a certification of the sensed measurements.

17) The system of claim 17 further comprising a tensioner connected to at least one of the plurality of stepper motors for maintaining a predetermined pressure between the stepper motor and the material.

18) The system of claim 17 wherein the measurement sensor is at least partially in physical contact with the material to be processed.

19) The system of claim 17 wherein the measurement sensor comprises pressure sensors, acoustic sensors, and optical sensors.